include lines of equal annual change in blue. The extreme values of the annual change in D are met with on the Canadian border on the Atlantic coast, where westerly declination has an annual increase of $6'$, and in the S.W. in Texas and California, where easterly declination has an annual increase of $3'$. Inclination is increasing as much as $7'$ a year in the extreme south of Florida, whereas in the extreme north, on both the Atlantic and Pacific shores, it shows an annual fall of $1'$. H is falling throughout the whole of the United States, the annual decrease varying from 10γ in the extreme north to 120γ in the extreme south. The volume contains a great mass of magnetic information in a convenient form.

C. CHREE.

Directions for a Practical Course in Chemical Physiology. By Prof. W. Cramer. Third edition. Pp. viii+119. (London: Longmans, Green, and Co., 1917.) Price 3s. net.

"THE text of this edition is (apart from a few verbal alterations) identical with that of the second edition. The changes in the external appearance of the book have been made with the object of keeping the price as far as possible at its former level." So runs the preface, and that being so, any extended notice of this book is unnecessary. The second edition was fully reviewed in NATURE for March 25, 1915, and we then took occasion to point out what we conceived to be its defects. These defects still remain, but, in spite of them, the work has been a success, seeing that a new edition has been necessary after so short an interval.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Reconstruction Problems and the Duty of Science.

IT is sufficiently obvious that the problems of reconstruction following the war will tax the intelligence and good will of mankind to the utmost. It is also certain that mistakes made during this period will have more serious consequences than similar errors in a period of less social plasticity. By the same token, wise moves will produce greater and more permanent good. Never before, perhaps, has the obligation to choose between good and evil been quite so insistent, or the danger of a wrong choice quite so perilous.

Already we observe several groups of people preparing to deal with this situation. Their methods are diverse, and their aims more or less conflicting. Upton Sinclair sends us the first number of a new periodical, devoted to social justice. Yesterday I attended a meeting in which college students were invited to consider the ethics of Jesus as a foundation for the new democracy. The speaker spent some time in explaining to us that the movement, which is a national one, was neither pacifist nor pro-German. Business men, we read in the papers, are inviting the Germans to consider the conditions under which it will be possible to resume commercial relations. All these movements, and others, invite public discussion, and are beneficial to that extent at least. Underlying the Christian and Socialist propaganda is the entirely right feeling that mankind must agree on some system of ethics, some basic philosophy, which will make for co-operation and human welfare. It is possible that there is more than one such system which would fairly serve our purpose; but it is certain that we must, in the main, agree. The very existence of democracy implies some such agreement, and its failures result from the partial lack of it.

So far, I think scientific men can reasonably, indeed enthusiastically, go with the religious and radical groups. We are all seeking an absolutely necessary basis for conduct. Yet at this point, where we seem unanimous, grave possibilities of conflict arise. The scientific man is obliged to ask: What will be the consequences of the doctrines we propose to adopt, and how will they harmonise with natural law? There was a time when it was generally agreed that illness was due to evil spirits, and in a certain sense the facts were as postulated. Yet the total ignorance of the nature of those "spirits," of bacteria, left man in a very defenceless position. Nature penalised him, and she always does, for his ignorance, not asking whether he "ought" to have known. So it must always be, and *mere* good intentions or pious motives, without wisdom, avail us nothing. They may avail less than nothing if they create an impression that our problems have been met, when they have only been evaded. This is clearly seen by the ablest representatives of most movements, but not so clearly by a large portion of the rank and file. It is because it is so easy to allow emotion to crowd out intellect, and then to lead it to waste its energies in uninformed sentimentalism, that unpatriotic motives have sometimes been ascribed to those whose love of their country and their fellows was actually keener than ordinary. Such injustice is naturally resented; but it remains a fact that there are many who for various reasons are particularly interested in preventing the great volume of hope and good will from turning the wheels of reform. To such all ineffective efforts afford "aid and comfort."

While the scientific fraternity, thus confronted with a perplexing situation, is making up its mind how to act, what may be considered a perfect manifesto on its behalf has come from an unexpected source. The *New Republic* of February 16 prints the report on reconstruction by the Sub-committee of the British Labour Party. The concluding passage of that report reads as follows:—

"The Labour Party is far from assuming that it possesses a key to open all locks, or that any policy which it can formulate will solve all the problems that beset us. But we deem it important to ourselves, as well as to those who may, on one hand, wish to join the party, or, on the other, to take up arms against it, to make quite clear and definite our aim and purpose. The Labour Party wants that aim and purpose, as set forth in the preceding pages, with all its might. It calls for more warmth in politics, for much less apathetic acquiescence in the miseries that exist, for none of the cynicism that saps the life of leisure. On the other hand, the Labour Party has no belief in any of the problems of the world being solved by good will alone. Good will without knowledge is warmth without light. Especially in all the complexities of politics, in the still undeveloped science of society, the Labour Party stands for increased study, for the scientific investigation of each succeeding problem, for the deliberate organisation of research, and for a much more rapid dissemination among the whole people of all the science that exists. And it is perhaps specially the Labour Party that has the duty of placing this

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advancement of science in the forefront of its political programme. What the Labour Party stands for in all fields of life is, essentially, democratic co-operation; and co-operation involves a common purpose which can be agreed to; a common plan which can be explained and discussed, and such a measure of success in the adaptation of means to ends as will ensure a common satisfaction. An autocratic sultan may govern without science if his whim is law. A plutocratic party may choose to ignore science, if it is heedless whether its pretended solutions of social problems that may win political triumphs ultimately succeed or fail. But no Labour Party can hope to maintain its position unless its proposals are, in fact, the outcome of the best political science of its time; or to fulfil its purpose unless that science is continually wresting new fields from human ignorance. Hence, although the purpose of the Labour Party must, by the law of its being, remain for all time unchanged, its policy and its programme will, we hope, undergo a perpetual development, as knowledge grows, and as new phases of the social problem present themselves, in a continually finer adjustment of our measures to our ends. If law is the mother of freedom, science, to the Labour Party, must be the parent of law."

In this spirit all students of science may unite. Through it, and not otherwise, may the decay of civilisation be arrested, and the fair fruits of ages of effort brought to maturity. T. D. A. Cockerell.

Boulder, Colorado, March, 1918.

The Motion of the Perihelion of Mercury.

The type of resistance suggested by Sir Oliver Lodge (Nature, April 18, p. 125) is very difficult to visualise. The motion of a planet consists practically of a steady motion in a circle, with a superimposed free vibration, the amplitude of which is proportional to the eccentricity, and the phase of which depends on the longitude of the perihelion. The hypothesis that the perihelion can be made to move without alteration in the eccentricity is equivalent to assuming that a free vibration can persist in a resisting medium without change of amplitude. It is true that the absolute resistance would be expected to be greater at perihelion than at aphelion, on account of the difference in density at the two points, but this difference contains the eccentricity as a factor, and it is for this reason that the rate of decrease of the eccentricity and the motion of the perihelion would be of the same order of magnitude.

The limitation of the resistance to a force parallel to the minor axis would mean that the departure of the orbit from circularity determines a very small part of the resistance, most of this being due to a general motion of the medium in that direction with a velocity far exceeding the parabolic velocity. Even without the difficulties introduced by the high density required, such a velocity could not be accepted.

One effect of a difference between longitudinal and transverse electromagnetic masses was shown by Mr. G. W. Walker, in the April *Philosophical Magazine*, to be a change in the plane of a planet's orbit. The nature of this change can be found without much difficulty to be a rotation of the plane about the projection on itself of the sun's motion in space, the speed of rotation being proportional to the product of the components of the sun's motion in and perpendicular to the plane. The rotation being about an axis in the plane of the orbit, the effect on the nodes should be much less than that on the inclinations, whereas the contrary is the case. Thus it seems that the motion of the node of Venus cannot be accounted for in this way, and either one of the two component velocities must be very small or the effect of absolute motion on electromagnetic mass must be in some way compensated in the law of gravitation itself. The absence of the variations in the eccentricities that would be expected to be produced by a motion of the sun through space also suggests that there is such a compensation. Harold Jeffreys.

A Plea for the Naturalist.

The naturalist is not so black as he is painted. Conditions of modern technological inquiry are against him; the splitting of species into geographical and local races, distinguished by the finest touches of colour or the minutest of structures, has put the detailed identification of many of our native creatures beyond his compass.

But there is still a wide field for the naturalist, the closer observation of the habits of our native creatures. It is to be regretted, therefore, that in this his proper field his work should be slighted and minimised by the worker who prides himself, and rightly, on his technical equipment for specialised work. In a recent issue of Nature (March 21) a writer grouped naturalists with "landowners, sportsmen, farmers, rat-catchers," as well as a large class of bird-lovers, as being of the people whose personal opinion "is really of very little moment," in a matter which, after all, is mainly one of observation—an inquiry into the economic significance of the feeding habits of birds.

Why the fact that a man possesses or farms a few acres should invalidate his natural history observations is not easily understood. And, after all, are the opinions of the naturalist really so much at fault? Many times during the last few years we have been told in effect that years of careful work by an experienced investigator, supplemented by the researches of many others, had at last made it "possible to state definitely that at the present time there is ample evidence of a far-reaching kind to prove that no quarter should be shown to the wood-pigeon," that the rook "is far too plentiful at the present time, that it prefers a grain diet, and that it is injurious," that "the starling has increased in numbers enormously," and that "the bullfinch and blackbird in fruit-growing districts are most destructive."

But the naturalist knew and had recorded these things; pigeon-shoots are not affairs of yesterday; and already in the early part of the fifteenth century the Scottish Parliament had passed a law for the destruction of rooks precisely on account of their "gret skaithe apone cornis." On the whole, the naturalists and farmers were right, and minute researches have confirmed their general opinions.

On the whole, too, the results of the minute researches are less definite than would at first sight appear, for, apart from the difficulty of contrasting vegetable with animal food as it is represented in the food canal of a bird some time dead, there is the danger of reaching conclusions from unconsciously selected specimens. The gull on the turnip-field is likely to be shot and sent for examination, that on the offal of the fishing village is likely to be left unharmed, and the percentage of injury caused by gulls rises accordingly. No one would dream of deprecating such inquiries as have been carried on. They are necessary and of the greatest value, and in the hands of an organised group of observant workers of wide sympathies they will yield a large proportion of truth. But they are not infallible.

The contributions of both naturalist and laboratory expert are necessary to the fullness of this knowledge, but one without the other leans on a broken reed.

April 11. James Ritchie.

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